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WASHINGTON, DC 20037-3213

EXAMINER

SUCH, MATTHEW W

ART UNIT	PAPER NUMBER
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2891

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09/06/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/752,700	Applicant(s) KUWADA ET AL.	
	Examiner Matthew W. Such	Art Unit 2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) 3-5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2 and 6-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. In view of the appeal brief filed on 18 September 2006, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

Examiner Assignment

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to the newly assigned examiner, Matthew W. Such, whose contact information is listed at the end of the present Office Action.

Drawings

3. The subject matter of this application admits of illustration by a drawing to facilitate understanding of the invention. Applicant is required to furnish a drawing under 37 CFR 1.81(c). No new matter may be introduced in the required drawing. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). The drawings must show every feature of the invention specified in the claims.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1 and 2 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 2 recites the limitations “the back” and “the edges” in lines 3 and 4 of the claim. There is insufficient antecedent basis for this limitation in the claim and it is unclear what is considered “the back” and “the edges” of the semiconductor element. For example, the semiconductor element could be a spherical semiconductor light emitting nanoparticle. The Examiner provisionally interprets the limitations “the back” and “the edges” as “a back” and “an edge”, respectively.

6. Claims 1 and 2 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term “tackiness” in claim 1 is a relative term which renders the claim indefinite. The term tackiness is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. All materials have some level of “tackiness” simply because they are capable of being measured with a tack test, such as the ball tack test.

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7. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim requires that the thermosetting sheet material is a "rubber-containing or rubber-modified polycarbodiimide resin". However, the manner in which the claim is written renders the claim indefinite because it is unclear what is included and excluded from the claim language. For example, the thermosetting material can be: a rubber-containing material, a rubber-containing resin material, a rubber-containing polycarbodiimide resin material, a rubber-modified polycarbodiimide resin, etc. Also, it is unclear whether the claimed material requires polycarbodiimide resin or not. The Examiner provisionally interprets that the material is a rubber-containing material, in order to give the Applicant the broadest reasonable interpretation.

8. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim requires that the tackiness of the sheet material before thermosetting is 2 to 15 in terms of ball tack. However, no units are specified in the claim. The ball tack test measures and reports the distance of the ball from the endpoint of the tack apparatus. Therefore, any units can be used for the numbers 2 to 15, such as centimeters, or millimeters, or inches, or feet or any arbitrary or proprietary units. Therefore, no matter what the material, the units can be arbitrarily set to yield a ball tack value of 2 simply by choosing a unit length that fits to the ball tack being from 2 to 15. Therefore any thermosetting material meets the claim.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. In so far as definite, claims 1-2 and 6-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Igarashi ('546). Igarashi teaches a semiconductor device and method of making the device with a substrate (Col. 7, Line 15; Element 2; Fig. 5B, for example), a semiconductor element (Col. 7, Line 14; Element 1; Fig. 5B, for example) mounted thereon through a bump bonding part (Col. 6, Lines 42-55; Element 211, 21; Fig. 5B, for example). The semiconductor element is encapsulated with a thermosetting rubber-containing material (Col. 7, Lines 19-23; Element 33; Fig. 5B for example) on a back and edges of the semiconductor element (interface surface between Element 33 and Element 1 in Fig. 5B, for example). The manner in which the claim is written does not limit what constitutes “back” and “edge” of the semiconductor element. Therefore the back and edge can be arbitrarily defined as shown in Fig. 5B (for example) of Igarashi. Regarding the recitation of “tackiness”, since all materials have some level of “tackiness” simply because they are capable of being measured with a tack test, such as the ball tack test, any material, such as the epoxy-rubber-resin of Igarashi meets the claim. Furthermore, since no units are specified for the ball tack value between 2 to 15 of the rubber-containing material, any material, such as the epoxy-rubber-resin of Igarashi meets the claim because the units can be arbitrarily selected in order to meet the claimed range of 2 to 15.

11. In so far as definite, claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamamoto ('404). Yamamoto teaches a semiconductor device and method of producing the semiconductor device comprising a substrate (Element 4; Fig. 6, for example) and a semiconductor element (Element 6; Fig. 6, for example) mounted thereon through a bump bonding part (Element 9; Fig. 6, for example). The semiconductor element has been encapsulated by coating a back and edges with a thermosetting rubber-containing material (Para. 0075, 0078, 0147; Element 3; Fig. 6, for example). The manner in which the claim is written does not limit what constitutes "back" and "edge" of the semiconductor element. Therefore the back and edge can be arbitrarily defined as shown in Fig. 6 (for example) of Yamamoto. Regarding the recitation of "tackiness", since all materials have some level of "tackiness" simply because they are capable of being measured with a tack test, such as the ball tack test, any material, such as the thermosetting rubber-containing material of Yamamoto meets the claim. Furthermore, Yamamoto teaches that the material inherently has tackiness (see Para. 0075 and 0078, for example).

12. In so far as definite, claims 1-2 and 6-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Ueda ('688). Ueda teaches a semiconductor device and method of making the device with a substrate (Element 22), a semiconductor element (Element 20) mounted thereon through a bump bonding part (Element 5). The semiconductor element is encapsulated with a thermosetting rubber-containing material (Para. 0030, 0071; Table 1; Element 2) on a back and edges of the semiconductor element (interface surface between Element 20 and Element 2, for

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example). The manner in which the claim is written does not limit what constitutes “back” and “edge” of the semiconductor element. Therefore the back and edge can be arbitrarily defined as shown in the Figures of Ueda. Regarding the recitation of “tackiness”, since all materials have some level of “tackiness” simply because they are capable of being measured with a tack test, such as the ball tack test, any material, such as the epoxy-rubber-resin of Ueda meets the claim. Furthermore, since no units are specified for the ball tack value between 2 to 15 of the rubber-containing material, any material, such as the epoxy-rubber-resin of Ueda meets the claim because the units can be arbitrarily selected in order to meet the claimed range of 2 to 15.

13. In so far as definite, claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Hotta ('096). Hotta teaches a semiconductor device and method of producing the semiconductor device comprising a substrate (Element 2) and a semiconductor element (Element 1) mounted thereon through a bump bonding part (Element 3). The semiconductor element has been encapsulated by coating a back and edges with a thermosetting rubber-containing material (Col. 5, Lines 54-65; Col. 6, Lines 10-13; Element 41). The manner in which the claim is written does not limit what constitutes “back” and “edge” of the semiconductor element. Therefore the back and edge can be arbitrarily defined as shown in the Figures of Hotta. Regarding the recitation of “tackiness”, since all materials have some level of “tackiness” simply because they are capable of being measured with a tack test, such as the ball tack test, any material, such as the thermosetting rubber-containing material of Hotta meets the claim.

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14. In so far as definite, claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Misumi ('484). Misumi teaches a semiconductor device and method of producing the semiconductor device comprising a substrate (Element 1) and a semiconductor element (Element 5) mounted thereon through a bump bonding part (Element 3). The semiconductor element has been encapsulated by coating a back and edges with a thermosetting rubber-containing material (Abstract; Col. 2, Lines 34-67; Col. 3, Lines 1-20; Element 4). The manner in which the claim is written does not limit what constitutes "back" and "edge" of the semiconductor element. Therefore the back and edge can be arbitrarily defined as shown in the Figures of Misumi. Regarding the recitation of "tackiness", since all materials have some level of "tackiness" simply because they are capable of being measured with a tack test, such as the ball tack test, any material, such as the thermosetting rubber-containing material of Misumi meets the claim.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. In so far as definite, claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto ('404) in view of Komoto ('409).

Yamamoto teaches that the thermosetting material is a rubber containing material, but does not teach that the thermosetting material is a rubber-modified polycarbodiimide resin.

Komoto teaches using rubber-modified polycarbodiimide resin (Abstract; Col. 5, Lines 48-53, for example) used for electronics applications. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a rubber-modified polycarbodiimide thermosetting material as taught by Komoto in the thermosetting material of Yamamoto. One would have been motivated to do so since Komoto teaches that the rubber-modified polycarbodiimide thermosetting material is an excellent adhesive material for electronics applications due to the flame-retarding heat-resistance and solder-resistance properties (Komoto Col. 3, Lines 25-40; Col. 6, Lines 8-21; Col. 10, Lines 1-5; Col. 11, Lines 38-41; Col. 12, Lines 10-12; Col. 13, Line 12, for example).

17. In so far as definite, claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto ('404) in view of Imashiro ('711).

Yamamoto teaches that the thermosetting material is a rubber containing material, but does not teach that the thermosetting material is a rubber-modified polycarbodiimide resin.

Imashiro teaches using rubber-modified polycarbodiimide resin (Abstract; Col. 1, Line 13; Col. 2, Lines 45-55; Col. 5, Lines 10-17, for example) used for electronics applications. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a rubber-modified polycarbodiimide thermosetting material as taught by Imashiro in the thermosetting material of Yamamoto. One would have been motivated to do so since Imashiro teaches that the rubber-modified polycarbodiimide thermosetting material is an excellent

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adhesive material for electronics applications due to the heat-resistance, formability, excellent adhesion strength, processability, and solder-resistance properties (Imashiro Table 2, for example).

18. In so far as definite, claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hotta ('096) in view of Komoto ('409).

Hotta teaches that the thermosetting material is a rubber containing material, but does not teach that the thermosetting material is a polycarbodiimide resin, which can have filler materials, for example (Col. 5, Lines 60-65).

Komoto teaches using rubber-modified polycarbodiimide resin (Abstract; Col. 5, Lines 48-53, for example) used for electronics applications. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a rubber-modified polycarbodiimide thermosetting material as taught by Komoto in the thermosetting material of Hotta. One would have been motivated to do so since Komoto teaches that the rubber-modified polycarbodiimide thermosetting material is an excellent adhesive material for electronics applications due to the flame-retarding heat-resistance and solder-resistance properties (Komoto Col. 3, Lines 25-40; Col. 6, Lines 8-21; Col. 10, Lines 1-5; Col. 11, Lines 38-41; Col. 12, Lines 10-12; Col. 13, Line 12, for example).

19. In so far as definite, claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hotta ('096) in view of Imashiro ('711).

Hotta teaches that the thermosetting material is a rubber containing material, but does not teach that the thermosetting material is a polycarbodiimide resin, which can have filler materials, for example (Col. 5, Lines 60-65).

Imashiro teaches using rubber-modified polycarbodiimide resin (Abstract; Col. 1, Line 13; Col. 2, Lines 45-55; Col. 5, Lines 10-17, for example) used for electronics applications. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a rubber-modified polycarbodiimide thermosetting material as taught by Imashiro in the thermosetting material of Hotta. One would have been motivated to do so since Imashiro teaches that the rubber-modified polycarbodiimide thermosetting material is an excellent adhesive material for electronics applications due to the heat-resistance, formability, excellent adhesion strength, processability, and solder-resistance properties (Imashiro Table 2, for example).

20. In so far as definite, claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Misumi ('484) in view of Komoto ('409).

Misumi teaches that the thermosetting material is a rubber containing material, but does not teach that the thermosetting material is a polycarbodiimide resin (Abstract, for example).

Komoto teaches using rubber-modified polycarbodiimide resin (Abstract; Col. 5, Lines 48-53, for example) used for electronics applications. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a rubber-modified polycarbodiimide thermosetting material as taught by Komoto in the thermosetting material of Hotta. One would have been motivated to do so since Komoto teaches that the rubber-modified polycarbodiimide thermosetting material is an excellent adhesive material for electronics

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applications due to the flame-retarding heat-resistance and solder-resistance properties (Komoto Col. 3, Lines 25-40; Col. 6, Lines 8-21; Col. 10, Lines 1-5; Col. 11, Lines 38-41; Col. 12, Lines 10-12; Col. 13, Line 12, for example).

21. In so far as definite, claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Misumi ('484) in view of Imashiro ('711).

Misumi teaches that the thermosetting material is a rubber containing material, but does not teach that the thermosetting material is a polycarbodiimide resin (Abstract, for example).

Imashiro teaches using rubber-modified polycarbodiimide resin (Abstract; Col. 1, Line 13; Col. 2, Lines 45-55; Col. 5, Lines 10-17, for example) used for electronics applications. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a rubber-modified polycarbodiimide thermosetting material as taught by Imashiro in the thermosetting material of Hotta. One would have been motivated to do so since Imashiro teaches that the rubber-modified polycarbodiimide thermosetting material is an excellent adhesive material for electronics applications due to the heat-resistance, formability, excellent adhesion strength, processability, and solder-resistance properties (Imashiro Table 2, for example).

22. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto ('404) in view of Nishikawa ('465).

Yamamoto teaches a tacky material for use as the thermosetting rubber-containing material, but does not teach that the ball tack is from 2 to 15.

Nishikawa teaches materials useful for use with semiconductor devices (Col. 9, Lines 23-24) wherein the tackiness level measured by ball tack is between 2 to 15 (Table in Cols. 15 and 16, for example). Nishikawa further teaches that pressure sensitive ball tackiness should be set depending on the desired application (Col. 16, Lines 3-24, for example). It would have been obvious to one of ordinary skill in the art at the time the invention was made to set the tackiness of the thermosetting resin material prior to the cure of Yamamoto to a value between 2 to 15 as taught by Nishikawa in order to ensure sufficiently without peeling (Nishikawa Col. 16, Lines 13-15, for example). It has been held that where the general conditions of a claim are disclosed in prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

23. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hotta ('096) in view of Nishikawa ('465).

Hotta teaches a tacky material for use as the thermosetting rubber-containing material, but does not teach that the ball tack is from 2 to 15.

Nishikawa teaches materials useful for use with semiconductor devices (Col. 9, Lines 23-24) wherein the tackiness level measured by ball tack is between 2 to 15 (Table in Cols. 15 and 16, for example). Nishikawa further teaches that pressure sensitive ball tackiness should be set depending on the desired application (Col. 16, Lines 3-24, for example). It would have been obvious to one of ordinary skill in the art at the time the invention was made to set the tackiness of the thermosetting resin material prior to the cure of Hotta to a value between 2 to 15 as taught by Nishikawa in order to ensure sufficiently without peeling (Nishikawa Col. 16, Lines 13-15,

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for example). It has been held that where the general conditions of a claim are disclosed in prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

24. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Misumi ('484) in view of Nishikawa ('465).

Misumi teaches a tacky material for use as the thermosetting rubber-containing material, but does not teach that the ball tack is from 2 to 15.

Nishikawa teaches materials useful for use with semiconductor devices (Col. 9, Lines 23-24) wherein the tackiness level measured by ball tack is between 2 to 15 (Table in Cols. 15 and 16, for example). Nishikawa further teaches that pressure sensitive ball tackiness should be set depending on the desired application (Col. 16, Lines 3-24, for example). It would have been obvious to one of ordinary skill in the art at the time the invention was made to set the tackiness of the thermosetting resin material prior to the cure of Misumi to a value between 2 to 15 as taught by Nishikawa in order to ensure sufficiently without peeling (Nishikawa Col. 16, Lines 13-15, for example). It has been held that where the general conditions of a claim are disclosed in prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Double Patenting

25. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection

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is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

26. In so far as definite, claims 1 and 2 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6,023,096 to Hotta. Although the conflicting claims are not identical, they are not patentably distinct from each other because Hotta teaches a semiconductor device and method of producing the semiconductor device comprising a substrate (Col. 8, Lines 29-32) and a semiconductor element (Col. 8, Line 33) mounted thereon through a bump bonding part (Col. 8, Line 45). The semiconductor element has been encapsulated by coating a back and edges with a thermosetting resin material (Col. 8, Lines 36-37; Col. 8, Lines 47-49). The manner in which the claim is written does not limit what constitutes "back" and "edge" of the semiconductor element. Therefore the back and edge can be arbitrarily defined. Regarding the recitation of "tackiness", since all materials have some level of "tackiness" simply because they are capable of being measured with a tack test, such as the ball tack test, any material, such as the thermosetting resin material of Hotta meets the claim.

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27. In so far as definite, claim 6 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6,023,096 to Hotta in view of Komoto ('409).

Hotta teaches that the thermosetting material is a rubber containing material, but does not teach that the thermosetting material is a polycarbodiimide resin (Col. 8, Lines 36-37 and 47-49).

Komoto teaches using rubber-modified polycarbodiimide resin (Abstract; Col. 5, Lines 48-53, for example) used for electronics applications. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a rubber-modified polycarbodiimide thermosetting material as taught by Komoto in the thermosetting material of Hotta. One would have been motivated to do so since Komoto teaches that the rubber-modified polycarbodiimide thermosetting material is an excellent adhesive material for electronics applications due to the flame-retarding heat-resistance and solder-resistance properties (Komoto Col. 3, Lines 25-40; Col. 6, Lines 8-21; Col. 10, Lines 1-5; Col. 11, Lines 38-41; Col. 12, Lines 10-12; Col. 13, Line 12, for example).

28. In so far as definite, claim 6 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6,023,096 to Hotta in view of Imashiro ('711).

Hotta teaches that the thermosetting material is a rubber containing material, but does not teach that the thermosetting material is a polycarbodiimide resin (Col. 8, Lines 36-37 and 47-49).

Imashiro teaches using rubber-modified polycarbodiimide resin (Abstract; Col. 1, Line 13; Col. 2, Lines 45-55; Col. 5; Lines 10-17, for example) used for electronics applications. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a rubber-modified polycarbodiimide thermosetting material as taught by Imashiro in the thermosetting material of Hotta. One would have been motivated to do so since Imashiro teaches that the rubber-modified polycarbodiimide thermosetting material is an excellent adhesive material for electronics applications due to the heat-resistance, formability, excellent adhesion strength, processability, and solder-resistance properties (Imashiro Table 2, for example).

29. In so far as definite, claim 7 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6,023,096 to Hotta in view of Imashiro ('711).

Hotta teaches a tacky material for use as the thermosetting rubber-containing material, but does not teach that the ball tack is from 2 to 15.

Nishikawa teaches materials useful for use with semiconductor devices (Col. 9, Lines 23-24) wherein the tackiness level measured by ball tack is between 2 to 15 (Table in Cols. 15 and 16, for example). Nishikawa further teaches that pressure sensitive ball tackiness should be set depending on the desired application (Col. 16, Lines 3-24, for example). It would have been obvious to one of ordinary skill in the art at the time the invention was made to set the tackiness of the thermosetting resin material prior to the cure of Hotta to a value between 2 to 15 as taught by Nishikawa in order to ensure sufficiently without peeling (Nishikawa Col. 16, Lines 13-15, for example). It has been held that where the general conditions of a claim are disclosed in prior

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art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Conclusion

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- i. Yamazaki ('418),
- ii. Yamazaki ('614)
- iii. and Yamazaki ('093)

each teach using rubber-containing thermosetting resins with tackiness in a semiconductor device with a substrate.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew W. Such whose telephone number is (571) 272-8895. The examiner can normally be reached on Monday - Friday 9AM-5PM EST.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley W. Baumeister can be reached on (571) 272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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